Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A device for detecting [[the]] a signal on a defect disc, said device comprising:

a servo control unit handling related electromechanical devices of said device;

a preamplifier receiving data from a lens and generating an RF signal for data process, servo control signals for said servo control unit and various signals for defect detection;

a slicer receiving and digitalizing said RF signal so as to generate digitalized RF signal;

a phase lock loop (PLL) synchronizing said digitalized RF signal to a system clock and counting the length of said digitalized RF signal;

a decoder decoding the length of said digitalized RF signal to a host;

a defect detection unit receiving said various signals for detecting different kinds of defects to set corresponding defect flag signals, wherein said defect detection unit includes means for ADefect1 detection, means for EFMDefect detection, means for RPDefect detection, means for Interruption detection, means for ADefect detection, and means for DSPDefect detection;

a logic combination unit running a suitable logic operation on said defect flag signals for detecting a particular defect.

2. (original) The device according to claim 1, wherein said related electromechanical devices include a spindle motor, a sled motor, and means for a lens slightly tracking and focusing move.

3. (original) The device according to claim 1, wherein said servo control signals further includes a

focusing error (FE) signal and a tracking error (TE) signal.

4. (original) The device according to claim 1, wherein said various signals at least include an envelope signal of said RF signal.

5. (original) The device according to claim 1, wherein said defect detection unit further receives eight to fourteen modulation (EFM) signals from said slicer and said PLL.

6. (currently amended) The device according to claim [[1]] 4, wherein said means for ADefect1 detection compares said envelope signal with a first threshold level, which is higher than an ADefect ~~usual defect~~ detection level, and sets a first corresponding flag signal when said envelope signal is lower than said first threshold level.

7. (currently amended) The device according to claim [[1]] 5, wherein said means for EFMDefect detection further includes:

comparing data length of each said EFM signal in a data frame ~~of said RF signal~~ with a first predetermined data length, and setting a second corresponding flag signal when more than n1 EFM signals have a data length ~~RF patterns are~~ shorter than said first predetermined data length;

comparing data length of each said EFM signal in said data frame ~~of said RF signal~~ with a second predetermined data length, and setting said second corresponding flag signal when more than n2 EFM signals have a data length ~~RF patterns are~~ longer than said second predetermined data length;

comparing data length of each said EFM signal in said data frame ~~of said RF signal~~ with a third predetermined ~~an serious~~ data length, and setting said second corresponding flag signal when more than

n3 EFM signals have a data length ~~RF patterns are~~ longer than said third predetermined ~~serious~~ data length; and

resetting said second corresponding flag signal after more than n4 EFM signals have a data length that is ~~RF patterns are~~ between said first and said second predetermined data lengths;

wherein said second predetermined data length is greater than said first predetermined data length, and said third predetermined data length is greater than said second predetermined data length.

8. (currently amended) The device according to claim 1, wherein said means for RPDefect detection compares an RFRP signal with an RPDefect ~~a third~~ threshold level, which is higher than an ADefect ~~said usual defect~~ detection level, and sets a third corresponding flag signal when said RFRP signal is lower than said RPDefect ~~third~~ threshold level, wherein said RFRP signal is a peak envelope, a bottom envelope, or a peak-to-bottom envelope of said RF signal.

9. (currently amended) The device according to claim [[1]] 4, wherein said means for Interruption detection compares said envelope signal with an interruption ~~a fourth~~ threshold level, ~~which is higher than an normal envelope signal,~~ and sets a fourth corresponding flag signal when said envelope signal is higher than said interruption ~~fourth~~ threshold level.

10. (currently amended) A method for detecting [[the]] a signal on a defect disc, said method comprising:

utilizing ADefect1 detection for detecting a shallow defect and a fingerprint and generating a first corresponding flag signal;

utilizing EFMDefect detection for detecting a predetermined ~~an abnormal~~ data length and

generating a second corresponding flag signal;

utilizing RPDefect detection for detecting a small defect and a data interruption and generating a third corresponding flag signal;

utilizing Interruption detection for detecting said data interruption and generating a fourth corresponding flag signal;

utilizing ADefect detection for detecting a deep defect and generating a fifth corresponding flag signal;

utilizing DSPDefect detection for detecting a defect through a variable threshold and generating a sixth corresponding flag signal; and

running a suitable logic operation on said first, said second, said third, said fourth, said fifth, and said sixth corresponding flag signals for detecting a particular defect.

11. (currently amended) The method according to claim 10, wherein said ADefect1 detection compares an envelope signal of an RF signal with a first threshold level, which is higher than an ADefect ~~usual defect~~ detection level, and sets said first corresponding flag signal when said envelope signal is lower than said first threshold level.

12. (currently amended) The method according to claim 10, wherein said EFMDefect detection further includes:

comparing data length of each of EFM signals in a data frame ~~of said RF signal~~ with a first predetermined data length, and setting said second corresponding flag signal when more than n1 EFM signals have a data length ~~RF patterns are~~ shorter than said first predetermined data length;

comparing data length of each said EFM signal in said data frame ~~of said RF signal~~ with a second

predetermined data length, and setting said second corresponding flag signal when more than n2 EFM signals have a data length ~~RF patterns are~~ longer than said second predetermined data length;

comparing data length of each said EFM signal in said data frame ~~of said RF signal~~ with a third predetermined ~~an serious~~ data length, and setting said second corresponding flag signal when more than n3 EFM signals have a data length ~~RF patterns are~~ longer than said third predetermined ~~serious~~ data length; and

resetting said second corresponding flag signal after more than n4 EFM signals have a data length that is ~~RF patterns are~~ between said first and said second predetermined data lengths;

wherein said second predetermined data length is greater than said first predetermined data length, and said third predetermined data length is greater than said second predetermined data length.

13. (currently amended) The method according to claim 10, wherein said RPDefect detection compares an RFRP signal with an RPDefect ~~a third~~ threshold level, which is higher than an ADefect ~~said usual defect~~ detection level, and sets said third corresponding flag signal when said RFRP signal is lower than said RPDefect ~~third~~ threshold level, wherein said RFRP signal is a peak envelope, a bottom envelope, or a peak-to-bottom envelope of an RF signal.

14. (currently amended) The method according to claim 10, wherein said Interruption detection compares [[said]] an envelope signal of an RF signal with an interruption ~~a fourth~~ threshold level, ~~which is higher than an normal envelope signal,~~ and sets said fourth corresponding flag signal when said envelope signal is higher than said interruption ~~fourth~~ threshold level.

15. (new) The device according to claim 1, wherein said DSPDefect detection means compares an

absolute difference of said RF signal and a frequency-domain filtered RF signal with a DSPDefect threshold level, and sets a DSPDefect flag signal when said absolute difference is greater than said DSPDefect threshold level.

16. (new) The method according to claim 10, wherein said DSPDefect detection compares an absolute difference of an RF signal and a frequency-domain filtered RF signal with a DSPDefect threshold level, and sets a sixth corresponding flag signal when said absolute difference is greater than said DSPDefect threshold level.

17. (new) A device for detecting a signal on a defect disc, said device comprising:

a servo control unit handling related electromechanical devices of said device;

a preamplifier receiving data from a lens and generating an RF signal for data process, servo control signals for said servo control unit and various signals for defect detection;

a slicer receiving and digitalizing said RF signal so as to generate digitalized RF signal;

a phase lock loop (PLL) synchronizing said digitalized RF signal to a system clock and counting the length of said digitalized RF signal;

a decoder decoding the length of said digitalized RF signal to a host;

a defect detection unit receiving said various signals for detecting different kinds of defects to set corresponding defect flag signals, wherein said defect detection unit includes means for ADefect1 detection, means for EFMDefect detection, means for RPDefect detection, means for Interruption detection, means for ADefect detection, and means for DSPDefect detection; and

a logic combination unit running a suitable logic operation on said defect flag signals for detecting a particular defect;

wherein said ADefect1 detection means compares an envelope signal of said RF signal with a first threshold level, and sets a first corresponding flag signal when said envelope signal is lower than said first threshold level;

wherein said EFMDefect detection means includes comparing data length of each said EFM signal in a data frame with a first predetermined data length, and setting a second corresponding flag signal when more than n1 EFM signals have a length shorter than said first predetermined data length;

comparing data length of each said EFM signal in said data frame with a second predetermined data length, and setting said second corresponding flag signal when more than n2 EFM signals have a data length longer than said second predetermined data length;

comparing data length of each said EFM signal in said data frame with a third predetermined data length, and setting said second corresponding flag signal when more than n3 EFM signals have a data length longer than said third predetermined data length; and

resetting said second corresponding flag signal after more than n4 EFM signals have a data length that is between said first and said second predetermined data lengths; wherein said second predetermined data length is greater than said first predetermined data length, and said third predetermined data length is greater than said second predetermined data length;

wherein said RPDefect detection means compares an RFRP signal with an RPDefect threshold level, which is higher than an ADefect detection level, and sets a third corresponding flag signal when said RFRP signal is lower than said RPDefect threshold level, wherein said RFRP signal is a peak envelope, a bottom envelope, or a peak-to-bottom envelope of said RF signal;

wherein said Interruption detection means compares said envelope signal with an interruption threshold level, and sets a fourth corresponding flag signal when said envelope signal is higher than said interruption threshold level;

wherein said DSPDefect detection means compares an absolute difference of said RF signal and a frequency-domain filtered RF signal with a DSPDefect threshold level, and sets a DSPDefect flag signal when said absolute difference is greater than said DSPDefect threshold level.